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REMARKS

Reconsideration and allowance of the claims in the application are requested.

Claims 1-21 are pending in the case. Claim 21 has been rejected under 35 USC 112, second paragraph as indefinite regarding the definition of “an area on a patient”.

Claims 1-3 have been rejected under 35 USC 102(b) as anticipated by Japanese Publication 06-021893 to Nagano Toshiharu, published October 18, 1986 (Nagano).

Claims 4-6, 8-11, 13-15, 18-20 have been rejected under 35 USC 103(a) as unpatentable over, or record, in view of a publication entitled, “Effects of Fog on the bit-error rate of a free-space laser communication system”, by B.R. Strickland et al., Applied Optics, Vol. 38, No. 3, published January 20, 1999 (Strickland), and Japanese Publication 61-234636, issued to Tadashi Lizuki, published April 11, 1985 (Lizuki).

Applicant has amended claim 21 to overcome the rejection under 35 USC 112, second paragraph.

Claim 1 and 4 have been cancelled without prejudice and combined as new claim 22.

Claims 4 and 6 have been cancelled without prejudice and combined as new claim 23.

Claims 12, 13 and 21 have been amended to clarify the invention with respect to the cited art.

Claims 2 and 3 have amended to depend upon new claim 22.

Claim 6-11 have been amended to depend upon new claim 23.

Claims 16-18 have been amended to be consistent with base claim 13.

Before responding to the rejections, Applicants would like to distinguish Nagano, Lizuki and Strickland from the present invention, (Willner), as follows:

1. Nagano discloses an optical space transmitter including an infra red transmission following the laser beam as an obstacle detector. When the intensity of the infrared transmission is decreased at a receiver, an output of the laser beam is stopped at the transmission unit. When the output of the laser beam is terminated, the irradiation of the obstacle, such as a person, and resultant damage is prevented. Nagano discloses a set of infra red transmitters surrounding a laser beam transmitter and set of infrared detectors surrounding the laser beam receiver. Nagano fails to disclose elements of Willner as follows:

A Nagano transmits infrared along the path of the laser beam to prevent an obstacle from being irradiated by the beam. The infrared transmissions fan out and are diffracted. When the infrared transmission is broken Nagano indicates a laser signal of weakened strength still reaches the receiver. Moreover, infrared transmissions have threshold setting problems for interrupting the laser beam due to the diffraction and fan out, and may be responsive to atmospheric conditions which needlessly terminate the laser. In contrast, Willner discloses a Continuous Wave (CW) laser beam surrounded by a concentric pulsed laser beam as a guard ring. There is no diffraction of the laser beam and fan out is not present unless the transmitter and receiver are not coaxially aligned, as described in the specification at page 9, lines 1 – 5. Thus in Willner, threshold settings are more precise, and atmospheric conditions do not needlessly terminate the laser. Accordingly, the infra red transmission in Nagano can not be deemed to be the equivalent of the guard laser beam of Willner. Nagano fails to disclose a laser beam surrounded by a guard laser beam.

B. Nagano discloses a return infrared signal shutting down the laser when the main infrared beam is interrupted by an obstacle. In contrast, Willner discloses generating a return laser signal altering the performance of the main laser beams by increasing the laser energy level or decreasing energy level to include termination. Nagano fails to disclose generating a return signal which alters the performance of the laser beam by increasing the energy laser level or decreasing the energy laser level to include termination.

C. Nagano discloses interruption of the infrared beam by an obstacle and shutting down the laser when the interruption occurs. In contrast, Willner discloses sensor means for detecting climatic conditions affecting the guard band, but not the main beam, and preventing the shutdown of the laser, which would otherwise occur due to the impairment of the guard beam. Nagano fails to disclose sensors means, which when activated by certain climatic condition, prevent shut down of the main laser.

2. Strickland discloses a laser beam propagating through an atmosphere is attenuated by absorption and scattering of radiation from fog, clouds, rain, snow, smoke and dust. Atmospheric attenuation is typically dominated by fog and clouds. Attenuation due to rain and snow is generally significantly less. Transmission through fog and clouds causes the laser communication system to cease operation. An experiment was conducted using an existing laser communication terminal to predict performance in the presence of fog. A model was developed to predict the performance of the laser communication transceiver in the presence of any fog or smoke. Strickland fails to disclose elements of Willner, as follows:

A. Strickland's model of fog and smoke impact on a laser beam does not provide any data or support for application to an infrared beam operating in a different frequency range. In any case, substitution of the Strickland laser beam for the infrared

transmission of Nagano would not prevent irradiation of the obstacle and shutting down the main laser to which Nagano is directed. In contrast, Willner is directed to preserving signal continuity in the laser and the impairment of the guard beam does not necessarily cause the main laser beam to shutdown, but rather the signal continuity of the main laser beam is continued for certain climatic conditions. Nagano and Strickland fail to disclose maintaining signal continuity of a main laser beam when a guard beam is impaired by climatic conditions.

3. Lizuki discloses a laser communication system temporarily storing data in a memory when communication is interrupted by fog or snow. When fog or snow occurs, the communication is interrupted when a decrease in a communication signal is detected. The communication signal is stored in an electronic memory on shutdown of the laser beam. Upon restoration of the laser beam, the content of the memory is transmitted using the time of normal intermittent communication. Lizuki fails to disclose elements of Willner, as follows:

A. Lizuki discloses a memory for storing transmitting signals when a decrease in signal level is detected. In contrast, Willner discloses switching means responsive to (a) an input signal to the laser, and (b) a return signal from a laser receiver. When the return signal is present, the switching means (i) directs the input signal to a storage means. When the return signal is absent, the switching means discharges the storage means or directs the input signal to the laser and awaits the return signal to store the input signal in the storage means upon termination of the laser beam. Lizuki fails to disclose a switching means in memory for directing an input signal to the laser or to the memory in the case of laser termination.

Summarizing, Nagano, Strickland and Lizuki, alone or in combination, disclose a laser communication system including an infrared guard band, which shuts down the laser communication system in the presence of an obstacle or in the case of climatic conditions, i.e.,

fog or snow. The cited references do not disclose (a) a main laser beam surrounded by a guard laser beam which when interrupted alters the performance of the main laser by increasing or decreasing the laser energy level including termination; (b) climatic sensors for detecting climatic conditions affecting the guard band, but not the main laser, which would otherwise cause shutdown of the main laser, and (c) switching means responsive to an input signal and to a return signal where the presence of the return signal directs the input signal to the storage and the absence of the return signal causes the switching means to discharge the storage and/or directs the input signal to the laser system. Without a disclosure, suggestion or teaching, in the cited references of element (a), (b) and (c) , there is no basis under 35 USC 102(b) or 35 USC 103(a) for the rejection of claims 2, 3,7-21. Withdrawal of the rejection and allowance of the rejected claims are requested.

Now turning to the rejection, Applicants responds to the indicated paragraphs of the Office Action, as follows:

RESPONSE TO ARGUMENTS:

Applicants note the Examiner's comments.

ALLOWABLE SUBJECT MATTER:

Applicants note the Examiner's comments.

CLAIM REJECTIONS – 35 USC 112:

Claim 21 has been amended to define a template disposed on a patient and including an opening in which surgery is performed. Applicants submit the amendment to claim 21 limits the surgery area to the opening in the template and not the entire human being.

Withdrawal of the rejection of claim 21 under 35 USC 112/2 is requested.


CLAIM REJECTIONS – 35 USC 102(b):

Claims 1 and 5 have been replaced by claim 22 which includes elements not disclosed in Nagano, as follows:

(i) “ a guard band laser arranged concentric to the main beam and generating a guard band beam to preserve input signal continuity in the main beam ;”

Nagano discloses a laser beam and an infrared transmission which travels along the laser beam and terminates the laser beam when the infrared transmission is interrupted. In contrast, Willner discloses a guard band laser concentric to a main laser beam and altering the performance of the laser when interrupted to preserve the input signal continuity when the guard band is interrupted. Nagano fails to disclose (a) a guard laser beam (an infrared transmission is not equivalent to a guard laser beam), and (b) preserving input signal continuity when the guard beam is interrupted (not shutting down the laser when interruption of the infrared transmission occurs).

(ii) ”means responsive to the return signal for altering the performance of the main beam by increasing the laser energy level or decreasing the laser energy level including termination;”

 Nagano shuts down laser when the infrared transmission is interrupted. In contrast, Willner alters the laser energy level and does not necessarily shutdown the laser. Nagano fails to disclose changing the laser energy level when the guard band beam is interrupted.

(iii) “sensor means for detecting climatic conditions of dust, rain and other environmental elements affecting the guard band and preventing shutdown of the laser .

Nagano discloses interruption of the infrared transmission shuts down the laser. There is no disclosure in Nagano relating to the impairment of the infrared transmission by climatic conditions, which would otherwise alter the performance of the main laser beam

Without a disclosure in Nagano relating to a guard band laser preserving input signal continuity for a main laser beam; altering the performance of the laser beam when the guard band is interrupted, and sensor means detecting climatic conditions affecting the guard band, but not affecting the performance of the main laser and preventing shutdown of the main laser, there is no basis under 35 USC 102(b) for the rejection claims 1 and 5, now combined as claim 22.

Withdrawal of the rejection and allowance of claims 1 and 5 , now claim 22 are requested.

Claims 2 and 3 depend upon claim 22 and are patentable on the same basis thereof.

REJECTION UNDER 35 USC 103(a):

Claims 4-6, 8-11, 13-15, 18-20 include elements not disclosed in Nagano in view of Strickland and Lizuki, as follows:

A. Claim 4 has been combined with claim 1 as new claim 23, as follows:

(i) "a guard laser concentric with a laser including an energy source and an optical service in a chamber coupled to an image response and providing a guard beam surrounding the laser beam as a protective layer for preserving input signal continuity of the laser beam;"

7 Nagano, Strickland and Lizuki all fail to disclose a guard laser beam concentric with a laser beam and preserving signal continuity of the laser beam when the guard beam is interrupted. Nagano and Lizuki shut down the laser beam when the infrared transmission is interrupted or the signal level of the laser declines. Strickland does not disclose a guard band. In contrast, Willner may or may not cause shut down when the guard band is interrupted and seeks to preserve input signal continuity..

(ii) A return signal laser responding to guard band interruptions as sensed by the parallel receiver, which activate the trigger circuit in generating a trigger signal to the return signal laser to shut down or modify the signal level of the laser beam by increasing or decreasing the energy level of the laser;"

Nagano discloses a return infrared transmitter, when activated, signals the infrared transmitter to shut down. Lizuki does not disclose a return signal, but shuts down the laser when received signal level decrease. Strickland does not disclose a return signal laser In contrast, Willner discloses parallel guard band receivers, such that interruption of any parallel receiver alters the performance of the laser beam, including shut down, via a return laser transmitter to the main laser. Page 5, lines 4-10. Nagano, Lizuki and Strickland all fail to disclose modifying the signal level of the laser by increasing or decreasing energy level including termination of the laser. when the parallel receivers are activated

(iii) “sensor means for detecting climatic conditions of dust, rain, and other environmental elements affecting the guard band, but not the signal continuity of the laser, and preventing shut down of the laser.”

Nagano, Lizuki, and Strickland all fail to disclose, suggest or teach sensor means detecting climatic conditions which would affect the guard band, but the not the signal continuity of the laser, and preventing shut down of the laser in the presence of such climatic conditions. Without a disclosure, suggestion or teaching in Nagano, Lizuka and Strickland relating to (a) a laser guard band preserving signal continuity in a laser beam; (b) a return signal laser responsive to a trigger signal to shut down or modify the signal of the laser beam by increasing or decreasing energy level in the laser, and (c) sensor means detecting climatic conditions, which affect the guard band but not the signal continuity of the laser and preventing shut down of the laser in response to such climatic conditions, there is no basis for a worker skilled in the art to implement claim 4, now combined with claim 1 as 23 from the disclosure of the cited art. The rejection of claim 4 now replaced by claim 23 under 35 USC 103(a) is not supported by the cited reference.

Withdrawal of the rejection of claim 4r (now claim 23), and allowance thereof are requested.

B. Claims 5 and 6:

Claim 5 and 6 have been cancelled and combined with claim 1 as claim 23.

C. Claims 8-11:

Claim 8-11 depend upon claim 23 and are patentable on the same basis thereof.

D. Claim 13:

(i) “transmitting and coaxially aligning a guard beam with the median laser beam as a protective layer surrounding the main laser beam and preserving the signal continuity of the input signal;”

Nagano, Lizuka and Strickland all fail to disclose a guard laser beam surrounding the main laser beam and preserving the signal continuity of the input signal, as discussed in conjunction with the consideration of claim 22.

(ii) “directing the input signal to a storage means while the return signal is present;”

Nagano and Strickland fail to disclose directing the input signal to a storage circuit while a return signal is present Lizuka discloses a voltage comparing circuit responsive to a decline in the received signal to direct the input signal into a memory along with time signals used to as part of transmitting the storage input signals. In contrast, Willner in Figure 4 discloses switching means 19, responsive to a return signal 52 and input signal 10 to direct the input signal to a storage means when the return signal is present, as described in the specification at page 9, lines 18-21. Lizuka’s detecting a change in signal level by a comparison circuit does not disclose or suggest to a worker skilled in the art a switching means responsive to a return signal and an input signal for preserving the continuity of the input signal when interruption of a guard band occurs.

(iii) “altering the performance of the main laser beam in response to the return signal by increasing the laser energy level or decreasing the laser energy level including termination”

Nagano and Lizuki shut down the laser when the guard band is interrupted or the laser signal declines. In contrast, Willner discloses laser energy level is changed, not necessarily terminated when the return signal is present.

Without a disclosure in Nagano, Lizuki, Strickland relating to (a) a guard laser beam preserving the signal continuity of the input signal; (b) generating a return signal in response to the interruption of the protective layer directing the input signal to a storage means while the return signal is present, and (c) altering the performance of the main laser beam in response to the return signal by increasing the laser energy level while decreasing laser energy level including termination, there is no basis for a worker skilled in the art to implement claim 13. The rejection of claim 13 under 35 USC 103(a) fails for lack of support. Withdrawal of the rejection and allowance of claim 13 are requested.

E. Claims 14 and 15:

Claim 14 and 15 describes elements not disclosed in the cited references, as previously indicated in the consideration of claims 22 and 23. In any case, claim 14 is dependent upon claim 13 and is patentable on the same basis thereof. Likewise claim 15 is dependent upon claim 13 and is patentable on the same basis thereof. Withdrawal of the rejection and allowance of claims 14 and 15 are requested.

F. Claims 18-20:

Claims 18-20 further limit claim 13 and are patentable on the same basis thereof.

G. Claim 5:

Claim 5 has been cancelled and combined with claim 1 as new claim 22. Claim 22 has been distinguished from the cited references, as described above in the consideration of the rejection under 35 USC 102 (b)

H. Claim 7:

Claim 7 now depends upon claim 23 and is patentable on the same basis thereof. Claim 23 has been previously distinguished from the cited references in paragraph A above..

I. Claims 16 & 17:

Claims 16 and 17 depend upon claim 13 and are patentable on the same basis thereof.

J. Claim 12:

(i) “means for sensing climatic conditions of dust, rain and other environmental elements affecting the guard beam and preventing shut down of the laser in response to such climatic conditions.”

Nagano discloses an infrared transmission, which is not monitored for sensitivity to climatic conditions. Lizuki and Strickland do not disclose a guard beam that monitors the beam laser beam, which is shut down for climatic conditions. None of the cited references disclose sensing the guard beam to determine affecting climatic conditions and upon such detection preventing the shut down of the main laser, which would otherwise occur if the guard beam was interrupted.

Nagano, Lizuki and Strickland all fail to disclose climatic sensing means for the guard band and without such disclosure, there is no support for the rejection of claim 12 under 35 USC 103(a). Withdrawal of the rejection of claim 12 and allowance thereof are requested.

K. Claim 21:

Applicant notes that no art has been cited against claim 21. The rejection of claim 21 under 35 USC 112/2 has been cured, as discussed above in the consideration of the rejections under 35 USC 112/2. Without a rejection on art, claim 21 is believed allowable and Applicants so request.

CONCLUSION:

Having canceled and combined claims 1, 4, 5 and 6 as new claims 22 and 23; distinguished claims 12, 13 and new claims 22 and 23 and their related dependent claims from the cited art and cured the rejections under 35 USC 112/2, entry of the amendment, allowance of the claims, and passage to issue of the case are requested.

AUTHORIZATION:

The Commissioner is hereby authorized to charge any additional fees which may be required for the timely consideration of this amendment under 37 C.F.R. §§ 1.16 and 1.17, or credit any overpayment to Deposit Account No. 09-0452, Order No. BOC919990075 (1963-7376).

Respectfully submitted,
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